

BOOK-TAX DIFFERENCES AND THE MEASUREMENT OF CORPORATE INCOME

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IN CONTRAST TO INDIVIDUAL TAXATION, WHERE PUBLIC-use versions of tax return information are available, there is no publicly available firm-level tax data for corporations. As a result, those wishing to conduct research on the corporate tax system must rely generally on the annual reports of corporations provided to satisfy SEC financial reporting requirements. While the use of such data is ubiquitous, its efficacy has never been thoroughly tested. In this paper, I outline the commonly known reasons for concerns about this data, present some new empirical information regarding these relationships, and summarize recent research that has addressed these issues.

Overall, there appears to be limited usefulness of financial information in making inferences about the cross-sectional characteristics of firms' taxable income. This result is not surprising, as each system is intended to serve a different purpose and to capture different concepts of income. In contrast, financial statements appear to provide valuable information about the level of tax owed in a given year.

DUAL ACCOUNTING SYSTEMS

Tax and financial reporting are separate, but related, accounting systems with distinct objectives. Financial statements are designed to provide information to shareholders and others to evaluate firm performance. As such, the accounting system places great weight on consistency over time within the firm, but less weight on conformability of all firms to identical assumptions regarding their businesses' accounting rules. Indeed, the discretion left by accounting standards is viewed as a virtue, as firms may apply the standards most appropriate to their situation. Firms within the same industry may

make different determinations about the amounts of revenue or expenses recognized in any given period, differences which should convey better information about each firm's operations to their respective shareholders.

Taxable income, the definition of which is subject to change by legislative action, provides a measure of income that leaves little room for the types of managerial discretion that may lead to horizontal differences in tax liabilities.

Financial accounting standards recognize that the amount of income calculated under each method is different, and various mechanisms have been adopted over time to report the implied differences in tax liabilities. Under SFAS 109, firms report a tax expense calculated from current-year financial reporting income, delineating the portion currently owed from that deferred due to differences in the measurement of income under each system. There are two sources of these differences. First, tax and financial reporting may have different rules for revenue and expense recognition, causing temporary differences in the amount of income in each measure, but which should reverse over time. The most obvious example of a timing difference is caused by depreciation, which is generally straight-line over an estimate of the asset's expected useful life (to some residual value) for financial reporting purposes, but accelerated (to no residual value) for tax. In the near term, such differences will lead to taxable income being less than financial income. At some future time, however, the amount of depreciation allowed for tax purposes will be less than reported for financial reporting, reversing the direction of the difference. Thus, the respective rules for depreciation lead to lower taxable income in the early years after property, plant, and equipment is placed into service, but higher amounts later on.

The second source of differences is permanent and arises when income or expense is accrued under one system but not the other. For example, interest on municipal bonds is generally excluded from the calculation of taxable income, but would be considered income under GAAP.

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Aside from these measurement differences, the entity encompassed by financial reports will generally be more inclusive than those for tax purposes. Under GAAP, firms are required to file consolidated financial statements for all operations in which the parent has at least a 50 percent interest. For tax purposes, consolidation is voluntary and not permitted unless there is at least 80 percent ownership. As a result, an observed set of consolidated financial statements is likely to include any number of separate taxable entities. These differences can be significant, and have been discussed by Dworin (1985), Manzon and Plesko (1996), and Plesko (1999).

INFERENCES ABOUT TAX STATUS

Over the years, researchers have developed numerous financial statement measures of tax return information to construct "effective," or average, tax rates. As observed by Callihan (1994), these measures have become important in the public debate over corporate tax policy. Omer et al. (1991) provide a description and analysis of the most commonly used measures, the definitions of which are presented in Table 1.

It is important to note that it may not be the designer's intent for these measures to capture statutory tax burdens. In particular, studies of average, or effective, tax rates, choose a measure of income based on financial statements in order to reduce or eliminate the endogeneity of tax responses and to abstract from the special preferences in the tax code that can lead to horizontal differences in the application of the code that would not be captured in tax information. Indeed, these studies often look to determine the extent to which such differential tax reporting leads to differences in tax burdens across firms with equivalent book income. For example, two companies may have the same taxable income and pay the same amount of tax, thereby having the same average tax rate. One of these companies may have designed its operations so that the tax code does not include some amount of earnings in the measure of income (foreign earnings, dividends received, or special depreciation rules, for example). In this case, although the amount of tax paid by each will be the same, the book income of the firms will differ, leading to a different measure of their tax burdens under this alternative income measure. Nonetheless, benchmarking each measure to taxable income will provide insight into the scope of any differences.

To evaluate the ability of financial statements to both measure the level of a tax-reported variable and to capture its variability, I use the following regression model used by Plesko et al. (1996)

$$(1) \text{Tax}_{\text{tax return measure}} = \alpha + \beta (\text{Tax}_{\text{financial statement measure}})$$

If the financial statement proxy were a perfect measure of the tax variable the regression results should have a statistically insignificant intercept ($\alpha \neq 0$) and a coefficient on the financial statement variable, β , of 1.0.

To perform the estimation, financial statements of corporations were matched to their tax returns for tax year 1992. Firms with apparent entity differences, or with foreign operations, were deleted. Descriptions of the tax return sample and the construction of the matched data set can be found in U.S. Internal Revenue Service (1992) and Plesko (1999), respectively.

RESULTS

Table 2 provides the results of the estimation of financial statement measures of income on two different measures of taxable income. The first, "Line28," is the amount of income calculated for tax purposes prior to the deduction of net operating loss carryforwards (NOLs) and other special deductions (such as Dividends Received). The second, "Income Subject to Tax," is the amount of income that determines tax liability. Unlike Line 28, which can take on any value, Income Subject to Tax is constrained to be non-negative.

For Line 28, four of the five measures have statistically significant coefficients, but all are statistically different from, and less than, one. Two of the five have statistically significant intercepts. Further, the amount of income variability explained varies from almost none (Porcano) to more than 70 percent (JCT).

The results are similar for Income Subject to Tax, shown in the bottom panel of Table 2. All but Zimmerman's measure (which is based on operating cash flows) have statistically significant intercepts, and all of the tax measures have coefficients less than, and statistically different from, one. Taken as a whole, the results of Table 2 imply that the use of financial statement information will introduce substantial error into the measurement of taxable income.

Table 3 repeats the analysis for two measures of tax liability: tax before credits (TBC) and tax after

Table 1
Tax Liability and Income Measures
(Including Compustat Data Item Numbers)

<i>Measure</i>	<i>Numerator</i>	<i>Denominator</i>
JCT	Current federal and foreign tax expense (63+64)	Pretax book income minus (equity income (loss) from unconsolidated subsidiaries and income (loss) from extraordinary and discontinued operations) plus income (loss) from minority interests. (18 + 16 + 49) – 55)
Porcano (POR)	Current federal tax expense (63)	Pretax book income minus equity income (loss) from unconsolidated subsidiaries plus income (loss) from minority interests. (18 + 63 + 49 + ((-1.0* 48) –55))
Zimmerman (ZIM)	Total tax expense minus change in deferred tax liability and ITC (16-change in 35)	Operating cash flow (12 – 41)
Shevlin (SH)	Total tax expense minus change in deferred tax liability (16-change in 74)	Pretax income minus (change in deferred tax liability/statutory marginal tax rate) (18 + 16 + 49 – (change in 74/0.34))
Stickney and McGee (SM)	Total tax expense minus deferred tax expense (16-50)	Pretax book income minus (deferred tax expense/statutory marginal tax rate) (18 + 16 + 49 – (50/.34))

All definitions are drawn from Omer et al. (1991, p. 60): and based on Joint Committee on Taxation (1983), Porcano (1986), Zimmerman (1983), Shevlin (1987), Stickney and McGee (1981).

credits (TAC), against the numerators of the tax rates defined in Table 1. In the case of TBC, the intercepts on all of the measures except Porcano's and Stickney and McGee's variables are statistically significant, but Porcano's measure, the current federal tax expense, has a coefficient statistically indistinguishable from one, and an R^2 of 0.918. The remaining measures all have estimated coefficients between 0.5 and 0.6.

In the second panel, the estimation is repeated for TAC. As in Panel A, Porcano's measure, current tax expense, performs the best, with both the highest coefficient on the measure, 0.89, and the highest R^2 , 0.94. As in the top panel, the remaining tax proxies have much lower coefficients, ranging from 0.44 to 0.50, and none have an R^2 exceeding 0.63. All of the coefficients on the tax proxies are statistically different from 1.0.

Taken together, these results suggest that financial reporting can provide useful tax information when the objective of the financial standard is to do so. The current tax expense, which performs so well in Table 3, is intended to capture each year's

actual tax liability, and is reported along with the portion that is, net, deferred either as a liability (when financial income is higher than taxable income) or an asset (when financial income is lower than taxable income).

Implications for Tax Rates

Given the weak results for measures of tax liability and taxable income, it is not surprising that recent research has found measures of average tax rates based on financial statements to be poor proxies for statutory tax rates. Plesko (1999) reports that the uses of such measures as explanatory variables will introduce sufficient measurement error to bias coefficients downward to as little as one-fifth the true estimate, and will also introduce bias into other explanatory variables. This does not suggest that there is no role for such measures, but merely reiterates that financial statements provide a separate measure of firm performance. These measures should not be used to make inferences about the statutory burden of corporate taxation.

Table 2
Financial Statement Measures of Income

Panel A

Dependant Variable: Line 28

Measure	Intercept	Income	F	adj R ²	obs
(1) JCT	3.385 (4.65)	0.735*** (0.074)	97.46***	0.745	-881
(2) POR	50.823*** (6.849)	-0.025 (0.072)	0.12	0.001	756
(3) ZIM	7.963 (9.637)	0.150*** (0.033)	20.78***	0.509	1111
(4) SH	20.570*** (6.604)	0.552*** (0.068)	65.37***	0.66	1030
(5) SM	9.987 (11.596)	0.614*** (0.183)	11.20***	0.566	973

Panel B

Dependant Variable: Income Subject to Tax (IST)

Measure	Intercept	Income	F	adj R ²	obs
(1) JCT	18.878** (9.384)	0.588*** (0.137)	18.4***	0.602	881
(2) POR	47.949*** (5.917)	0.062 (0.063)	0.96	0.063	756
(3) ZIM	9.274 (5.937)	0.161*** (0.021)	60.56***	0.686	1111
(4) SH	32.421*** (7.822)	0.483*** (0.08)	36.61***	0.601	1030
(5) SM	14.565* (7.48)	0.642*** (0.117)	30.36***	0.737	973

Significance levels: ***.01, **.05, *.10

In examining the response of firms to changes in tax policy, it is the marginal rather than the average tax rate that matters. In this area, recent results are more encouraging. Traditionally, researchers have used simple binary variables to control for the tax status of firms through the presence of NOLs, as in Mackie-Mason (1990). Such a simple approach, however, has been thought to miss many important differences across firms. To improve on this, Manzon (1994) and Graham (1996) have developed alternative measures in an attempt to better capture individual firm differences. In practice, however, Plesko (1999) finds these approaches unnecessary and reports that binary variables controlling for the presence of net operating losses and

positive taxable income perform at least as well, if not better, than more sophisticated alternatives.

CONCLUSIONS

The ability to measure the effects of taxation is central to empirical work in corporate tax policy. However, while taxes are an important element in corporate decisionmaking, the determination of a firm's tax liability is based on a separate set of rules than income reported to shareholders. Publicly available data appear to have limited ability to provide the necessary information to measure taxable income, and hence evaluate the statutory burden of the corporate tax in the same setting as designed within the tax code.

Table 3
Financial Statement Measures of Tax Liability

<i>Panel A</i>					
<i>Tax Before Credits</i>					
<i>Measure</i>	<i>Intercept</i>	<i>Income</i>	<i>F</i>	<i>adj R²</i>	<i>obs</i>
(1) JCT	7.045 (4.578)	0.576** (0.227)	6.43**	0.578	769
(2) POR	0.831 (0.586)	0.986*** (0.043)	538.58***	0.918	894
(3) ZIM	9.865*** (2.741)	0.512*** (0.081)	40.05***	0.616	1032
(4) SH	10.352*** (2.783)	0.511*** (0.082)	38.42***	0.604	1030
(5) SM	6.275 (4.46)	0.591*** (0.178)	11.07***	0.643	973
<i>Panel B</i>					
<i>Tax after Credits</i>					
<i>Measure</i>	<i>Intercept</i>	<i>Income</i>	<i>F</i>	<i>adj R²</i>	<i>obs</i>
(1) JCT	6.028 (4.62)	0.506** (0.203)	6.21**	0.562	769
(2) POR	0.303 (0.63)	0.894*** (0.039)	525.61***	0.939	894
(3) ZIM	9.060*** (2.36)	0.441*** (0.074)	35.75***	0.584	1032
(4) SH	9.488*** (2.395)	0.439*** (0.075)	33.84***	0.569	1030
(5) SM	5.711 (3.916)	0.515*** (0.157)	10.83***	0.625	973

Significance levels: ***.01, **.05, *.10

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